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DISCRIMINATION TRAINING AND SELF-EVALUATION IN THE TEACHING OF PRONUNCIATION.

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AN EXPERIMENT WAS CONDUCTED TO DETERMINE THE EFFECT OF PHONEME DISCRIMINATION TRAINING UPON THE ABILITY OF SUBJECTS TO DISCRIMINATE AMONG FRENCH PHONEMES AND TO DISCRIMINATE FRENCH PHONEMES FROM THEIR ENGLISH NEAR-EQUIVALENTS, TO IMITATE THE PRONUNCIATION OF FRENCH PHONEMES, AND TO MAKE VALID JUDGMENTS OF THEIR OWN PRONUNCIATION. THREE GROUPS OF UNDERGRADUATES WITH NO PREVIOUS EXPERIENCE IN FRENCH RECEIVED TREATMENTS CONTAINING VARYING PROPORTIONS OF DISCRIMINATION TRAINING AND PRONUNCIATION PRACTICE. WHEN TESTED, THE GROUPS WHICH HAD RECEIVED THE HIGHEST PROPORTION OF DISCRIMINATION TRAINING PERFORMED DISCRIMINATION TASKS MORE ACCURATELY AND MIMICKED THE PRONUNCIATION OF FRENCH WORDS BETTER THAN THE GROUPS WITH HIGHER PROPORTIONS OF PRONUNCIATION PRACTICE. THERE WAS NO OVERALL DIFFERENCE IN THE NUMBER OF ERRORS IN SELF-EVALUATION THOUGH THE GROUP WHICH HAD RECEIVED THE HIGHEST PROPORTION OF DISCRIMINATION TRAINING TENDED TO BE MORE SEVERE IN ITS EVALUATION THAN THE OTHER GROUPS. IT APPEARS THAT DISCRIMINATION TRAINING IS AN EFFECTIVE TECHNIQUE IN THE TEACHING OF THE PRONUNCIATION OF FOREIGN LANGUAGES SINCE IT RESULTS IN BETTER PRONUNCIATION AND STRICTER SELF-EVALUATION. BASED ON THE RESULT OF STRICTER SELF-EVALUATION, THE AUTHOR RECOMMENDED DISCRIMINATION TRAINING FOR USE IN LABORATORY CONTEXTS OR PROGRAMED INSTRUCTION WHERE THERE IS NO INSTRUCTOR TO MAKE EVALUATIONS. THIS DOCUMENT IS A REPRINT FROM THE "INTERNATIONAL REVIEW OF APPLIED LINGUISTICS IN LANGUAGE TEACHING," VOLUME 4, NUMBER 1, MARCH 1966. (AUTHOR)

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DISCRIMINATION TRAINING AND SELF-EVALUATION IN THE TEACHING OF PRONUNCIATION

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DISCRIMINATION TRAINING AND SELF-EVALUATION IN THE TEACHING OF PRONUNCIATION

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L'article rend compte d'une expérience effectuée pour préciser les effets d'exercices de discrimination sur l'étude de la prononciation d'une deuxième langue (en l'occurrence, le français); plus spécifiquement, on cherchait des réponses aux questions suivantes:

Quel groupe – les étudiants ayant pratiqué la discrimination sans la prononciation ou ceux ayant suivi le programme contraire –

1. distinguerait mieux les sons français d'une part, et d'autre part entre ceux-là et des sons anglais?
2. imiterait mieux les sons de la langue étrangère?
3. jugerait plus exactement de leur propre prononciation?

L'expérience a donné lieu aux conclusions suivantes:

Les étudiants ayant pratiqué la discrimination sans prononcer distinguaient mieux entre les sons et prononçaient mieux que ceux qui avaient pratiqué la prononciation mais pas la discrimination. Les premiers tendaient à évaluer leur propre prononciation plus sévèrement, les seconds avec plus d'indulgence que leurs examinateurs.

Der Artikel unterrichtet über ein Experiment, das unternommen wurde, um die Wirkung von Diskriminationsübungen auf das Studium der Aussprache einer Fremdsprache (in diesem Fall des Französischen) zu untersuchen; genauer gesagt: man suchte Antworten zu folgenden Fragen:

Welche Gruppe – Schüler, die nur die Diskrimination (ohne selbst zu sprechen) geübt hatten, oder solche, die einem gegensätzlichen Programm gefolgt waren – wäre eher imstande

1. die Laute des Französischen einerseits und andererseits die Laute des Englischen von den französischen zu unterscheiden?
2. die Laute der Fremdsprache besser zu imitieren? Und
3. die eigene Aussprache besser zu beurteilen?

Das Experiment führte zu folgenden Ergebnissen:

Schüler, die nur die Diskrimination, ohne selbst zu sprechen, geübt hatten, unterschieden die einzelnen Laute besser und hatten auch selbst eine bessere Aussprache als die, die die Aussprache, aber nicht die Diskrimination geübt hatten. Die ersteren neigten dazu, die eigene Aussprache strenger zu beurteilen, die letzteren waren nachsichtiger mit sich selbst als ihre Prüfer.

The language laboratory, which we have seen develop so rapidly in recent years, seems, upon casual observation, to be a marvelous tool for teaching the pronunciation of a foreign language, for it allows the student to hear authentic native pronunciation, and to compare his pronunciation with that of the native

speaker. Indeed, articles in popular periodicals and the claims of manufacturers' advertising agents represent the language laboratory as the final solution to the problem of learning to pronounce a foreign language.

Further consideration, however, reveals that using the language laboratory to teach pronunciation is not without serious problems. Anyone with a day's experience teaching high school or college students to pronounce French nasalized vowels does not need to be reminded that they are unable to judge whether or not their pronunciation matches that of the model. They frequently believe that their pronunciation is accurate when it is not. This is only to be expected, since at the beginning stages they cannot know which features are important and which are not, nor do they know what contrasts must be made. For this reason some teachers have been reluctant to allow their students to work unsupervised in a language laboratory for fear that they might practice incorrect pronunciation while under the impression that they were pronouncing correctly. The teacher would then be faced with the task of undoing bad pronunciation habits.

It is hardly possible, however, to staff language laboratories with anything like the number of teachers or monitors competent to detect and remedy errors who would be needed to prevent students from practicing poor pronunciation. Then too, if the language laboratory is going to require the constant active presence of the teacher, it will not be possible to realize many of the advantages which laboratories are supposed to bring to language teaching.

A technique widely used, particularly among those who are striving to make language laboratories function as a teaching machine, is discrimination training. Before the student is ever allowed to attempt the pronunciation of a particular sound in the foreign language, he is taught to distinguish it from all sounds, whether of the foreign language or his own native language, with which he is likely to confuse it. Then after he is able to make all the necessary discriminations, he attempts the pronunciation of the sound he is to learn and evaluates his own pronunciation, using as his criteria the discriminations he has learned.

While this technique has appeared from casual observation to be rather effective, certain studies have indicated that its usefulness may be definitely limited. A study conducted by Lane and Schneider indicated that little could be expected from discrimination training [1]). A study by Pimsleur, on the other hand, indicated that discrimination training may be effective with regard to certain pronunciation problems, but ineffective with others [2]).

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[1]) Harlan Lane and Bruce Schneider. Methods for self-shaping echoic behavior *Modern Language Journal,* 47, 1963, 156.

[2]) Paul Pimsleur. Discrimination training in the teaching of French pronunciation. *Modern Language Journal*, 47, 1963, 202.

A study was conducted at Indiana University in an attempt to learn more about the effects of discrimination training in teaching pronunciation[3]). French was used as the target language. Answers were sought to the following questions:

1. How will students who receive specifically designed discrimination training without pronunciation practice compare, in ability to discriminate French sounds from one another and from English sounds, with students who receive pronunciation practice?
2. How will students who receive discrimination training without pronunciation practice compare, in ability to mimic foreign language sounds, with students who receive pronunciation practice?
3. How will students who receive discrimination training compare, in ability to make valid judgments about their pronunciation, with students who receive pronunciation practice?

METHOD

Three groups of twenty-one subjects were established. All subjects were undergraduates, native speakers of English with normal hearing and no apparent speech defects. None of them had any experience with French either through study or residence in a French-speaking community and none had any extensive experience in any other foreign language. Subjects were assigned to groups on a random basis.

All subjects were administered the same set of pretests consisting of the *Modern Language Aptitude Test*[4]), the Pitch, Timbre and Tonal Memory subtests of the *Seashore Measures of Musical Talent*[5]), and a multiple choice Phoneme Discrimination Test composed of twenty-five sets of English and French monosyllables. In addition to these tests, data were obtained on the age, high school rank, and auditory acuity of each of the subjects. These initial data were analyzed by means of an analysis of covariance to assess the effects of the differences among the groups upon the results of the posttests. No differences were found which had any significant effect upon the results of the posttests and it was assumed for the purposes of the study that the groups were comparable.

The three groups were given different treatments designated A, B and C. The treatments were designed to give the subjects discrimination training, pronunciation practice, or both, using French phonemes which are known from

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[3]) The study was performed under the terms of a grant from the Indiana Language Program. The assistance of Profs. Albert Valdman and Nicholas A. Fattu is gratefully acknowledged.

[4]) John B. Carroll and Stanley M. Sapon. *Modern Language Aptitude Test.* New York: Psychological Corp., 1959.

[5]) Carl E. Seashore *et al. Seashore Measures of Musical Talent.* Camden, N. J.: Radio Corp. of America, 1939.

experience and on the basis of contrastive analysis to constitute learning problems for American students.

Problems primarily of a phonemic nature were the nasalized vowel triad F/ɛ̃/, F/ɑ̃/ and F/ɔ̃/, which cause relatively little interference, except for the tendency of Americans to add [n] after these vowels; the corresponding sequences of oral vowel plus F/n/ (F/ɛn/, F/an/ and F/ɔn/), which involve a great deal of interference from the corresponding English sequences; and two front, rounded vowels, F/y/ and F/ø/, both of which require the establishment of new phoneme categories and unfamiliar bundles of distinctive features.

Problems which were primarily phonetic in nature were F/i/ and F/e/, both of which may be affected by a carry-over of the[j] glide from English, and F/u/ and F/o/, which may be affected by a carry-over of the[w] glide. These four vowels involve a large amount of interference from English in that the pronunciation of the vowel serves as a stimulus to English speakers for the formation of the glide. This habit must be overcome to pronounce the French vowels accurately. One consonant, F/r/, was selected to illustrate the case where little interference occurs, but where, on the other hand, little positive transfer is available to facilitate learning.

The nasalized vowel, F/œ̃/, was not used because of the possibility of difficulty arising in scoring it since the contrast between F/ɛ̃/ and F/œ̃/ is not maintained in all dialects, and several dialects were represented among the scorers. The low-mid vowel series, F/ɛ/, F/œ/ and F/ɔ/ was not used since these vowels and the corresponding high-mid vowels are in complementary distribution in some dialects, but may contrast in stress position in other dialects. Dialect differences among the scorers again could have led to difficulties in scoring.

Treatment A gave guided practice in mimicry of monosyllabic French words containing the sounds selected for the study, but avoided as much as possible any discrimination training. Treatment B gave training in discrimination between the sounds selected for the study and the most likely sources of interference, whether in English or in French, but gave no pronunciation practice. Subjects were instructed not to speak during the course of the treatment. The subjects indicated their answer to each of the discrimination problems on an answer sheet and were given the correct answer immediately. Treatment C was a combination of half of Treatment A and half of Treatment B. Half the number of items from each exercise of Treatments A and B were used rather than half the exercises in order to avoid any disparity in the techniques employed.

The discrimination sequences took longer to present than the pronunciation sequences because of the time required for students to mark their answers and to make corrections. The treatments were equalized in terms of the number of items to which the subjects were exposed. Each treatment contained the same number of items.

The training programs were recorded on tape by a team of two native speakers of French and two Americans. The voices were selected to avoid any undesirable regional characteristics. The recorded programs were played through individual headphones from a central source. This assured relatively equal quality of sound regardless of the position of the subject in the room and assured that all subjects had equal exposure to the material. The equipment used for pronunciation practice was audio-active, providing the subject with a simultaneous amplification of his utterances.

Immediately after the training programs identical posttests were administered to the three groups.

1. A pronunciation test was administered in which monosyllabic French words containing the sounds used in the study were presented by means of a recording to be mimicked by the subject. Each sound occurred three times in the test. The items used for the pronunciation test were, insofar as possible, members of a pair of words distinguished by the contrast between the sound being tested and one of the sounds most likely to be substituted for it by Americans. By this means pronunciation errors were likely, at the same time, to be lexical errors to which the scorers would react more consistently and rigorously. Responses were recorded on tape for later scoring.

2. The phoneme discrimination test administered as a pretest was given a second time.

3. The subjects listened each to the recordings they had made for the pronunciation test, and indicated whether they thought their attempts approximated the model or not. Items were to be scored + (correct) or – (incorrect) with no intermediate steps. No instructions were given as to how correctness should be determined. Subjects were thus forced to rely on the impression they had gained of the phonetic norms for the various sounds from the treatments they had undergone.

All tests except the pronunciation test were amenable to objective scoring and posed few problems. The pronunciation tests were scored by three scorers working independently. Each test was thus scored three times. To prevent any possible bias on the part of the scorers the tapes were randomized and were not marked in any way which would indicate group membership. The items to be scored consisted of one phoneme or of a sequence of phonemes considered as a unit. The task was simplified in that the items occurred in monosyllabic utterances. The fact that many of the items were members of minimal pairs would, it is assumed, have the effect of increasing the reliability since the meanings of the words would act as a factor to stabilize the judgments of the scorers. The system of scoring was the same as that used by the subjects in evaluating their own tests. More precise criteria were used, however, in determining the acceptability of a subject's effort—substitution of one phoneme for another was judged as an error, as was an inappropriate "accent". "Accent" was not further defined since it was felt that the natural reaction of the scorer, based on long-

established listening habits, would result in more reliable scores than any recently imposed criterion. In the interest of increasing reliability it was decided to limit the task to be performed by the scorers to a simple choice between acceptability and unacceptability. This is a natural judgment to make and one that is fairly frequently practiced, as for instance when one hears a foreigner speaking and notes that the sounds he produces do not stay within the normal distortion limits allowed for native speakers. The possibility of evaluating the subjects' tests on a scale was rejected since this is a very artificial and complex task rarely, if ever, performed in natural speech situations. Two of the scorers were native speakers of French and the third an American with training in phonetics and several years experience in teaching French. (It was not possible to obtain a measure of scorer consistency because of problems which arose in scheduling.)

RESULTS AND DISCUSSION

Thirteen variables were extracted from the three posttests. Mean scores and standard deviations were obtained for each group on each variable. F ratios were also obtained for each variable as a test of significance. F-ratios higher than 3.15 indicate differences among the means which are significant at the .05 level while F-ratios higher than 4.98 indicate differences which are significant at the .01 level. Such differences are marked * and ** respectively.

Since the variables represented widely varying numbers of items so that variables representing a large number of items would tend to show a larger amount of absolute deviation than variables representing a smaller number of items, the deviations of the group means were transformed into standard scores. The mean of Group A was taken as zero in each case and the mean scores of Groups B and C were expressed as standard score deviations from the mean of Group A. Since the F-ratios which had already been obtained indicated only that significant differences existed among the variables, but did not indicate which of the differences was significant, a T test of significance was applied to those comparisons where the F-ratio indicated significant differences. Any significant differences which were found are indicated: * and ** again indicate differences significant at the .05 and .01 levels respectively.

The first variable was the Phoneme Discrimination Test, used as a posttest.

Variable		Group A	Group B	Group C	F-ratio
1. Phoneme Discrimination Test	Mean	64.4	68.9	67.9	5.16**
	S.D.	4.4	4.2	5.2	

The differences in performances correspond to differences in treatment since Group A had no discrimination training while Groups B and C did. The relative amounts of deviation, as shown below in terms of standard scores, also correspond to the relative amounts of discrimination training received by each.

Variable	−1.5 −1.0 −.5 0 .5 1.0 1.5	Significant Differences
1. Phoneme Discrimination Test	A C B	A–B**, A–C**

Both groups which received discrimination training performed significantly better on this variable than Group A, which had no discrimination training.

Variables 2, 3 and 4 were the rating of the pronunciation test tapes by each of the three scorers. The score was the number of items marked correct.

Variable 5 was a composite rating derived from the three individual ratings above. The three rating sheets for each subject were compared item by item and the rating of each item by the majority of the scorers was taken for the composite; for example, if an item was rated as incorrect by two scorers and as correct by the third, it was marked incorrect on the composite rating.

Variable		Group A	Group B	Group C	F-ratio
2. Pronunciation Scorer 1	Mean	24.2	28.2	26.2	4.95*
	S.D.	4.3	3.3	4.7	
3. Pronunciation Scorer 2	Mean	19.7	26.0	23.2	5.52**
	S.D.	6.4	5.3	6.6	
4. Pronunciation Scorer 3	Mean	17.6	21.6	20.0	2.92
	S.D.	4.9	5.9	5.3	
5. Pronunciation Composite	Mean	21.0	27.7	25.0	9.80**
	S.D.	4.8	4.8	5.1	

Two scorers found significant differences between Groups A and B. The composite rating also showed significant differences between Groups A and C. Scorer 3 found no differences great enough to be significant though his ranking of the groups agrees with the other two scorers and with the composite rating.

Variable	−1.5 −1.0 −.5 0 .5 1.0 1.5	Significant Differences
2. Pronunciation Scorer 1	A C B	A–B**
3. Pronunciation Scorer 2	A C B	A–B**
4. Pronunciation Scorer 3	A C B	
5. Pronunciation Composite	A C B	A–B**, A–C*

The groups which received discrimination training again performed better on this variable than Group A. The relative amounts of deviation of Groups A and B correspond to the relative amounts of discrimination training they had received.

Variable 6 was obtained by comparing the composite rating sheet item by item with the rating sheets which the subjects had used in evaluating their own pronunciation. The total number of items for which the subjects' self-evaluation agreed with the composite rating was recorded.

Variable 7 was derived by again comparing the self-evaluation rating sheets with the composite rating sheet and counting the number of items where the composite rating indicated a correct pronunciation, but where the subject had rated his own pronunciation as incorrect.

Variable 8 was derived in the same way as variable 7 except that a count was made of the number of items where the composite rating indicated an incorrect pronunciation, but where the subject had rated his own pronunciation as correct.

Variable		Group A	Group B	Group C	F-ratio
6. Agreement with Composite	Mean	24.1	25.9	25.0	1.42
	S.D.	3.8	3.9	2.3	
7. Right called Wrong	Mean	3.9	6.8	5.6	3.66*
	S.D.	3.5	3.9	3.1	
8. Wrong called Right	Mean	11.0	6.3	8.4	6.29**
	S.D.	5.3	3.5	3.8	

The groups did not differ significantly with regard to the number of items where they agreed with the composite rating. The small absolute differences follow the same pattern as variables 1 through 5.

Significant differences were found, however, when the two types of errors of self-evaluation were considered. The groups which had had discrimination training made more errors of the type where the subject rated himself as having pronounced incorrectly when the composite rating indicated a correct pronunciation. On the other hand they made fewer errors of the type where the subject rated himself as having pronounced correctly when the composite rating indicated that he had pronounced incorrectly. These differences show up clearly in terms of standard score deviations.

Variable	−1.5	−1.0	−.5	0	.5	1.0	1.5	Significant Differences
6. Agreement with Composite				A	CB			
7. Right called Wrong				A	C	B		A–B**
8. Wrong called Right		B		C	A			A–B**

It appears that the groups which had had discrimination training were more strict in evaluating themselves than the group which had had no discrimination training. One might cautiously advance the theory that the discrimination training received by groups B and C had caused them to establish a narrower phonemic target than was required by the scorers whereas Group A, which had had no discrimination training, had established a wider phonemic target than was required by the scorers. It would seem to be pedagogically advantageous to have students establish narrower phonemic targets than are required by native speakers since this would tend to keep them safely within the allowable range of phonetic variation, whereas a wider target would lead to more frequent transgressions of the distortion limits allowed by the foreign language.

Performance on five types of pronunciation problems, as indicated on the composite rating sheets, constituted the last five variables. The total number of items marked as having been pronounced correctly was taken as the score.

Variable		Group A	Group B	Group C	F-ratio
9. Nasalized vowels	Mean	3.8	5.8	5.8	8.57**
	S.D.	1.4	1.9	2.1	
10. Oral vowel + F/n/	Mean	7.2	7.0	6.2	1.85
	S.D.	1.8	1.9	1.9	
11. Front, Rounded Vowels	Mean	2.6	4.3	3.9	7.75**
	S.D.	1.5	1.1	1.6	
12. Unglided Vowels	Mean	6.9	9.3	8.3	7.59**
	S.D.	1.9	1.9	2.3	
13. F/r/	Mean	0.6	0.5	0.9	1.62
	S.D.	0.7	1.0	0.8	

The groups which received discrimination training pronounced the nasalized vowels better than the group which had no discrimination training. It might be suggested that discrimination training had the effect of teaching the

subjects the new phonemic categories and also that it helped to overcome the interference with the English sequence of a nasalized vowel followed by a nasal consonant.

There were no significant differences among the groups in the pronunciation of the oral vowel plus F/n/ sequences. It may be observed that the performances of all three groups was rated quite high on this variable, as compared to the rating of the nasalized vowels. A possible explanation may lie in the fact that the F/n/ of these sequences as recorded on the tapes by the native speaker was quite clearly released. The subjects might, therefore, have interpreted the vocalic element of the release as a vowel and reacted to the stimulus as though it contained two syllables with a CVCV pattern. If this were true, the vowel preceding /n/ would be less likely to be nasalized than in a CVC pattern and the interference from English reduced so that discrimination training, which is a technique for overcoming interference, would have had less effect. Had the sequences been recorded with a less definite release, the results might have been quite different.

Highly significant differences were found with regard to both front, rounded vowels and the unglided vowels, in favor of the groups with discrimination training. The relative amounts of deviation again correspond to the relative amounts of discrimination training.

No significant differences were found in the pronunciation of F/r/. As was indicated earlier, this phoneme creates little interference for Americans, so discrimination training could be expected to be of little effect.

Variable	−1.5	−1.0	−.5	0	.5	1.0	1.5	Significant Differences
9. Nasalized vowels				A		CB		A–B**, A–C**
10. Oral vowel + F/n/			C	BA				
11. Front, Rounded Vowels				A		C	B	A–B**, A–C**
12. Unglided Vowels				A		C	B	A–B**, A–C**
13. F/r/				AB	C			

CONCLUSIONS

The data obtained make it possible to answer the questions posed at the outset as far as the group of subjects who participated and these treatments are concerned.

1. Subjects who received discrimination training during the study were better able to discriminate French sounds from each other and from English sounds than subjects who received no discrimination training, but received pronunciation practice instead.

2. The subjects who received discrimination training without pronunciation practice were able to pronounce the sounds of French with greater accuracy than those who received pronunciation practice without discrimination training.

3. There were no over-all differences between subjects who received discrimination training and those who received pronunciation practice with regard to the ability to make valid judgments about their own pronunciation. However, differences did appear with regard to the types of errors they made in evaluating their pronunciation. Those who had received discrimination training tended to err on the side of greater severity than the scorers who rated them, whereas those who received only pronunciation practice tended to err on the side of greater leniency than the scorers.

While many questions concerning discrimination training remain unanswered, the data provided by this study would indicate that it is an effective technique for teaching the pronunciation of a foreign language. Of particular interest is the finding that students can be made more critical of their own attempts to pronounce the sounds of a foreign language, so that with properly designed materials they should be able to work effectively on their own in laboratory practice sessions for a conventional course or in a self-instructional course.

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